



PRESSURE CONCEPT & MEASUREMENT



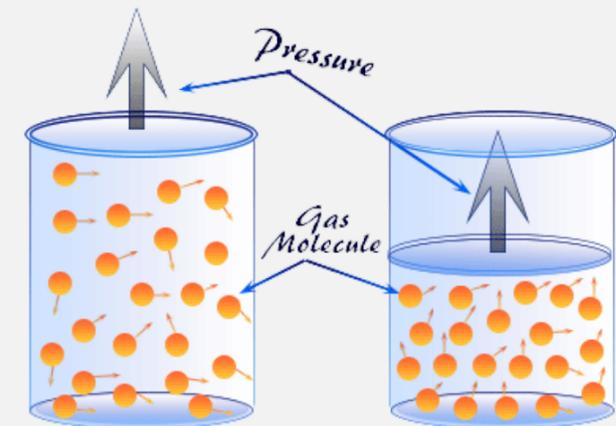
BUILDING COMPETENCE, INSPIRING CONFIDENCE

Course Objectives

- Understand fundamental pressure concepts and different pressure types used in industry
- Identify and differentiate between various pressure measuring devices
- Select appropriate pressure gauges, transmitters, and accessories for specific applications
- Understand installation practices, protection devices, and common field issues
- Interpret pressure transmitter types, principles, and signal outputs
- Apply safety and compliance requirements including ATEX & IECEx considerations

Target Audience

- Instrumentation & Control/Maintenance Engineers
- Process Engineers
- Inspection, Commissioning, and Reliability personnel



$$\text{Pressure (P)} = \frac{\text{Force (F)}}{\text{Area (A)}}$$

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Course Content

Introduction to Pressure

- Definition of Pressure
- Basic Pressure Concepts

Types of Pressure

- Absolute Pressure
- Atmospheric Pressure (14.696 psia)
- Barometric Pressure
- Gauge Pressure
- Differential Pressure
- Hydrostatic Pressure
- Line Pressure
- Static Pressure
- Working Pressure
- Vacuum

Units of Pressure

- Common pressure units and conversions

Fundamentals of Pressure Measurement

- Measurement principles
- Application considerations

Course Content

Pressure Measuring Devices

- **Pressure Gauges**

- Types of Pressure Gauges
 - Bourdon Tube (C-Type)
 - Spiral Bourdon Tube
 - Helical Bourdon Tube
- Advantages of Spiral & Helical Bourdon Tubes over C-Type
- Bellows Pressure Element
- Diaphragm Pressure Elements
- Ring Balance Manometer

- **Gauge Accessories & Protection**

- Pressure Gauge Snubber
- Liquid-Filled Pressure Gauge
- Overload Pressure Protectors
- Condensate Bottles / Pots
- Pigtail / Syphon

Course Content

Pressure Transmitters

- **Types of Transmitters**

- Pneumatic Pressure Transmitter with Controller
- Electronic Pressure Transmitter

- **Electronic Pressure Transmitters**

- Decoding of Electronic Pressure Transmitter Nameplate / Strip
- Transmitter Process Connections
- Remote Seal Diaphragm

- **Pressure Transducer Technologies**

- Resistive Pressure Transducer
- Capacitive Pressure Transducer
- Piezoelectric Pressure Transducer
- Inductive Pressure Measurement
- Hall Effect Pressure Measurement

Course Content

Pressure Switches

- Pressure Switch Operation (Cut-in & Cut-out)
- Types of Switching Functions
- Dead Band of Pressure Switch
- Manual & Automatic Reset
- Pressure Switches with Micro-Switches
- Accuracy & Repeatability
- Cycling Rate & Service Life
- Control System Voltage Requirements
- Process Fittings
- Enclosure Protection Ratings (IP)
- Hazardous Area Certification: **ATEX & IECEx**

Summary & Practical Insights

- Common field problems and best practices
- Selection guidelines



Instructor



Mr. Aftab Ahmed Mazari **Instrumentation Expert**

Mr. Aftab Ahmed Mazari has over 43 years of extensive practical experience as an Instrument Engineer. He completed his science graduation from Punjab University and received industrial instrumentation training from Russia.

He began his professional career at Pakistan Steel, where he served for 10 years. He later joined Fauji Fertilizer Company (FFC) and retired after completing 30 years of service with rich and diverse experience. Following his retirement, he worked as an Instrument and Consultant Engineer with SABIC in Saudi Arabia for one year.

Mr. Aftab Ahmed Mazari possesses wide expertise in instrumentation consultancy, Reliability Centered Maintenance (RCM), reliability engineering, and professional training. He has delivered training programs and courses to both local and international clients, including SABIC in Saudi Arabia and multinational companies such as ENI, Lotte, BHP, Engro, and HUBCO.

He has developed several training aids for instrument engineers and technicians, including simulators and training rigs such as vibration simulators, vibration switch testing rigs, speed simulators, compound gear simulators, and SOV training rigs. In addition, he has designed and produced cutaway models of control valves, pressure safety valves (PSV), rotameters, temperature sensors, pressure regulators, volume boosters, and trip relays.

Mr. Aftab Ahmed Mazari has also authored eight industrial instrumentation books for instrument and operations personnel, which are widely referred to in various industrial facilities across Pakistan.

Logistics

Duration

1 day

Location

Client site or Lahore

Training Instructors

Mr. Aftab Ahmed Mazari

Get in Touch

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